



# Alolkoy

**The  
Publication  
of the  
Channel  
Islands  
National  
Marine  
Sanctuary**

*Winter  
1997*

*Volume 9  
Number 4*

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SANTA BARBARA MUSEUM OF NATURAL HISTORY

CHANNEL ISLANDS



NATIONAL MARINE SANCTUARY

## From the Bridge

# We've Just Started

By Ed Cassano, Sanctuary Manager

It has been a busy year for the staff of the CINMS, and an exciting one for me. The CINMS has embarked on many new initiatives and partnerships designed to effectively implement our management plan and the National Marine Sanctuaries Act.

This issue's annual report summarizes key programs supported by our cooperative agreement with the Santa Barbara Museum of Natural History as well as other institutions with which the CINMS promotes sustainable use and resource protection. The year 1997 will see full implementation of many activities started in 1996. The Sanctuary, for example, is developing a cutting edge Web site with the Regional Alliance Information Networking that is packed with current information and interactive features. Our Web address is on the back page.

This issue also marks the last volume edited by Vic Cox. Vic has been a valuable asset to both the CINMS program and the *Alolkoy*. The magazine won accolades under his editorship. He has accepted a full-time editorial position at UC Santa Barbara in their Public Affairs office.

Though their gain is our loss, we are fortunate that he and his family will remain in Santa Barbara. We all wish Vic and his family well on this new endeavor and look forward to their continued involvement in the programs at the CINMS as part of our extended network of supporters.



©1996, David Brown, Passage Productions

## Editor's Watch

# Editor's Last Ride

Farewells are not fun, but when it is time for an editor to pass the baton they are necessary. Moving on to other opportunities—the greener pastures are at UC Santa Barbara—does not mean severing ties with either the Santa Barbara Channel or the hard-working folks at the Sanctuary. Depending on the new editor's judgement, my work may yet be found in the *Alolkoy*. But this is my last ride as editor.

Though only two names are listed in the production box, many individuals have contributed to the value readers find on the *Alolkoy*'s pages. Most of these people write, photograph or draw for us without monetary compensation. They simply want to share their information and talent with others who appreciate a healthy sea and its wildlife as much as they do. Bouquets to them, and to our 3,000 readers, for a very satisfying three years. May you all extend a helping hand to the new editor, and join in living the motto, "Take only memories; leave only bubbles."



©1994, Vic Cox

Cover: A humpback spouts close enough to the whalewatch boat Condor to spray onlookers. (Photo: ©1995, Fred Benko)

# Blue Whales Favor Sanctuary Dining

By Paul Fiedler

For the past few years, from June through September, blue whales have been frequent visitors to Sanctuary waters, coming to feed on dense swarms of the shrimplike crustaceans known as krill. The whales drew scientists eager to learn more about why so many endangered blues visit these summer feeding grounds and what this might mean for the global recovery of blue whale stocks.

In a cooperative effort to answer these questions the NOAA's Southwest Fisheries Science Center conducted a Whale Habitat and Prey Study last July. This was the second WHAPS done (see Spring 1996 *Alolkoy*), but both had the same objectives: (1) to study the distribution and activities of blues and other large whales in the area; (2) survey the distribution of their prey, (3) and measure physical and biological habitat variables influencing the distribution of whales and prey.

The center's team spent nearly four weeks aboard NOAA's oceanographic ship *David Starr Jordan* counting and photographing whales, sampling krill and measuring the water's biological productivity as well as its temperature and salinity. Twelve days were devoted to an intensive survey within Sanctuary boundaries, and 10 days to cover a larger region between Point Conception and San Nicolas Island.

A total of 467 cetacean sightings were made in Sanctuary waters, including 271 blue whales, 14 humpback whales and 5 minke whales. A clear pattern can be seen in mapping results (see below) from a two-day survey along the shelf edge of the



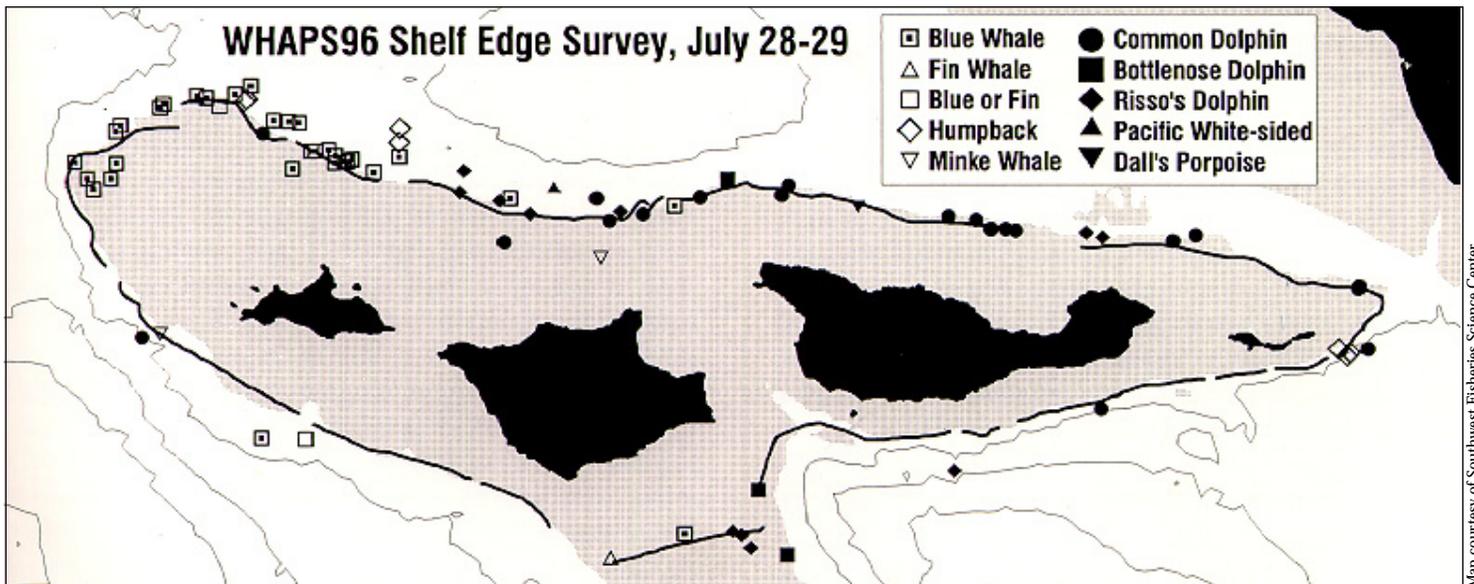
A blue whale rests just below the surface in the Santa Barbara Channel.

Courtesy of the Condor

four northern Channel Islands: Blue whales were most abundant to the west along the north side of San Miguel and Santa Rosa islands, while dolphins were most abundant to the east around Santa Cruz.

Additional surveys across the shelf revealed that most blues were feeding on the broad shelf northwest of San Miguel, where dense patches of large krill were observed. Strong winds blowing out of the northwest upwell the water over the shelf in this area. The upwelled water is cold, well-mixed and rich in nutrients; it supports a healthy crop of microscopic plants, called phytoplankton. This phytoplankton, and the small animals that graze on it, support the abundant krill found there.

Continued on page 7



Results of a two-day survey, one of many made last summer during intensive study of whales in the Channel, show blues favored the feeding grounds above a subsea shelf off San Miguel Island.

Map courtesy of Southwest Fisheries Science Center



*This blue whale cow was still nursing her calf when the camera took their family portrait in the Sanctuary.*

# Measuring the Blues Below from the Sky Above

By M.A. Donahue, W.L. Perryman and J.W. Gilpatrick Jr.

The blue whales that have been feeding near the Channel Islands the past few summers are the same as those found along Baja California in the winter months. Repeated sightings of uniquely marked individuals confirm the connection to Mexico. Our work with these whales has also established that they are a distinct population from other blue whales in the North Pacific, including those once commonly hunted by Japanese and Soviet whalers from Japan to south of the Aleutian Islands.

This is important to the international management of a whale species whose members were reduced by commercial whaling to very low levels before being given protection in 1965. The International Whaling Commission (IWC), which is charged with managing the blues and other endangered whales, considers all blue whales in the North Pacific as one management unit. But we see increased numbers of scientists who now think blue whales in this region consist of several populations.

To manage an endangered species effectively, it is important to determine the boundaries of isolated groups. One reliable indicator of long-term isolation is the comparison of differences in the form and structure (the morphology) of animals in different groups. To gather highly precise comparative data, scientists at NOAA's Southwest Fisheries Science Center (SWFSC) have been using airplanes and special cameras to photograph the blue whales around the Santa Barbara Channel Islands.

In addition to the blues, we are using aerial photography to investigate various aspects of the natural history of gray and bowhead whales as well as smaller species, such as belugas and a variety of dolphins.

Measuring the sizes of whales from aerial photographs, a technique known as photogrammetry, helped us determine whether or not these blue whales have significantly different morphology from blues that live in other areas of the world. We can identify individual blue whales because the mottled coloration of each whale's skin is unique. Using computer imaging software we also measure the length and other body proportions of the whales in our photographs.

Based on these measurements our results suggest that the blues feeding in the Sanctuary are morphologically different from the blues killed in other parts of the North Pacific by whalers. We can be confident of this because whalers kept logs that included the length, sex, and location of each captured whale.

Photogrammetry depends on very high resolution images, which in our case are taken from an airplane moving over the water at approximately 100 miles an hour. The military surplus aerial reconnaissance camera we use moves the film at the same speed of the image when the shutter is open. This feature eliminates the blur that would otherwise result from the aircraft's forward motion.

The great advantage of using aerial photography to collect data on endangered species is that it allows us to obtain necessary information with little disturbance to the animals under study. This kind of research is ideally suited for animals in protected environments like the Sanctuary.

*M.A. Donahue, W.L. Perryman and J.W. Gilpatrick Jr. are fisheries biologists with the National Marine Fisheries Service's Southwest Fisheries Science Center in La Jolla, California.*

# Making Positive ID through Photography

By John Calambokidis

A pair of blue whales lunge to the surface together, their cavernous mouths engulfing a swarm of krill trying in vain to escape. As I follow in a small boat, I am awestruck at this magnificent sight from the Santa Barbara Channel, but I am intent on capturing a more important photograph. My heart races as I watch the back of a whale roll to the surface, finally exposing the small dorsal fin before the flukes. I click off shots showing the subtle yet distinctive pigmentation pattern along the whale's back.

For 10 years, I and other biologists associated with Cascadia Research have been studying blue whales along the California coast. Photography has been a critical tool in tracking specific animals and documenting their movements with minimal intrusion. In fact, photo identification has been successfully employed with a number of other whale species in the last 20 years, including orca, sperm, right, bowhead, humpback, fin, and minke whales.

A slightly different technique is used to document each species. Humpback whales, another species in our research off California, are identified by the coloration and markings on the underside of the tail flukes, and the scalloping along the trailing edge of the flukes.

When we started tracking off California in 1986, we quickly learned that the best way to photograph whales was to approach them in small, inflatable boats. Using cameras with 300 mm telephoto lenses and shooting highspeed black and white film allowed us to move as quickly and unobtrusively as possible. A scientific research permit gave us legal access to these whales.

Each year we usually identify more than 200 individual blue whales and 250 to 400 humpback whales along the California coast. Our photographic catalog of individual whales contains more than 800 humpbacks, representing almost every individual in this population, and just under 1,000 blue whales. Resighting histories of many of these animals is extremely detailed, with some whales resighted 50 or more times over many years and thousands of miles.

From such detailed records, we have been able to learn valuable new information about humpback whales. The whales that feed during the summer and fall off California, for example, do not generally travel north of the Washington/British Columbia border, though they move widely within this area searching for prey.

During the winter most of these animals migrate to areas

off mainland Mexico and Baja. Only a few travel to the major wintering area in Hawaii or to another wintering area far offshore of Mexico. We recently discovered that some humpback whales from California migrate as far south as Costa Rica and Panama, previously undescribed wintering areas.

The humpback whales we track number just over 700 animals (our slightly larger catalog includes some whales that have died). The population appears to be slowly increasing, though the reproductive rate of some of the California females is lower than for humpbacks in other areas.

Some of the most surprising information from our research has been on blue whales. Despite the large number of whales we have identified, our statistical calculations tell us that the total

California population is about 2,000 individuals, far more than had been previously suspected.

Large numbers of blue whales sometimes concentrate in coastal waters, such as in the Santa Barbara Channel. We once estimated 250 blue whales were feeding in one area off central California.

Most of the blue whale population is scattered, often feeding in waters 100 or more miles offshore.

Our research has also benefited from the cooperation of many researchers and naturalists. Recently, this has included Channel whale watch boats, like the *Condor*, and organizations like the Whale Corps, a group of trained volunteers organized by the Santa Barbara Museum of Natural History and the Sanctuary. These naturalists on whale watch boats collect valuable data and photographs.

We are currently developing an estimate of humpback whale populations throughout the entire North Pacific for the National Marine Fisheries Service, thanks to the collaboration of more than a dozen research groups from Japan to Alaska. Support from other agencies, such as the Channel Islands National Marine Sanctuary, has allowed us to collect detailed data from critical areas.

John Calambokidis founded Cascadia Research in Olympia, Washington, in 1979, and has studied blue and humpback whales off California since 1986.



Cascadia Research

The coloration and scar patterns mark this humpback as an individual.

# Gray Whales Are World-Class Commute

By Charles D. Woodhouse

The gray whale's sense of timing would shame the most punctilious traveler. You can virtually set your calendar by the annual appearance off Santa Barbara of these wonderful creatures. They come from various northern origins and each winter converge on a few, favored destinations along coastal Mexico. Why they choose these lagoons each year is just one among many intriguing questions raised by the gray whale migration.

We don't know what compels these leviathans to spend most of the year swimming distances that would challenge a fish. We do know they typically swim at about five miles an hour.

Research is turning up some answers about the Gray. Often held up as the world's longest mammalian migration, the gray whale's annual trek varies widely. It depends on where the group has found sufficient food. Some groups swim from the eastern Beaufort Sea, bordering Alaska's Arctic coast. Others come no farther than from northern California.

Why does the gray whale migrate? One of several possibilities is that Mexico's mild lagoons increase the calves' survival rate, but sufficient food for the adults is found mostly in colder northern waters. With a current population officially estimated at more than 21,000, migration appears to work well for the grays. The journey is just not as long as previously thought for at least some of the animals.

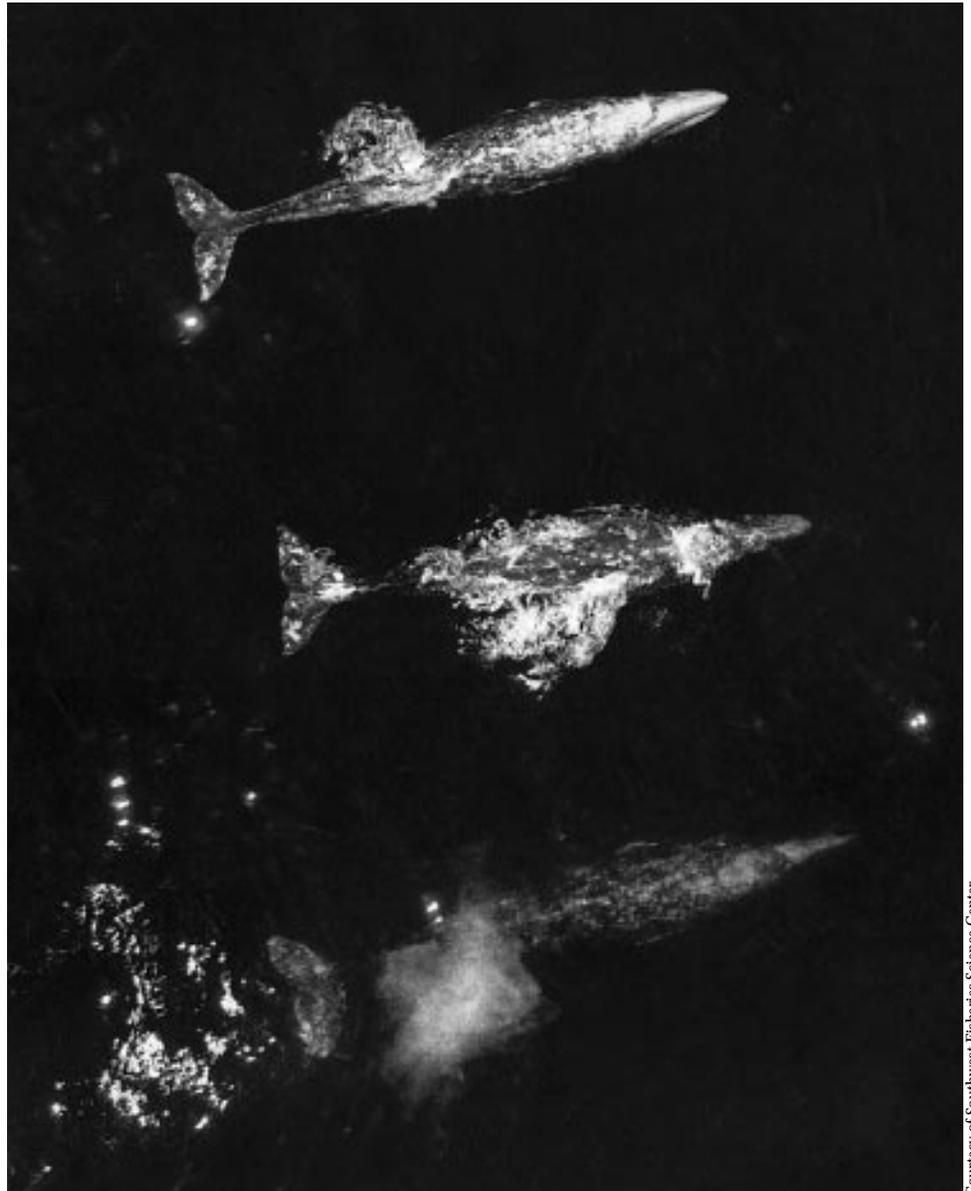
How do grays navigate? We're still not sure about this, but imagine that you are a large gray whale. You spend most of your time submerged. Seas of the north are often murky. Eyesight is of limited value. Hearing may provide an advantage, but we do not know about that either. Among whale species, you alone possess a set of single hairs projecting from your nose. Perhaps these

enhance your tactile sense, like a cat's whiskers. As a whale who explores the sea floor for food, it could be that your ability to sense the bottom helps you track lengthy coastal migration routes.

What routes do grays take in the Channel region? An ongoing study by the Santa Barbara Museum of Natural History tells us that at least since 1975 these whales follow specific routes through the Channel. For southbound migrants, the coast abruptly breaks east-west at Point Conception, providing a

natural way point. A few grays round the point and follow the mainland coastline, but many head south to Santa Rosa Island. They may travel past Santa Cruz and Anacapa islands' northern edge or swim through inter-island passages.

Southbound whales appear off Santa Barbara in late December. Their presence builds to a crescendo in January. By February their numbers taper off and the initial northbound grays appear. Coastal whale watching is best early in the season from ports in Ventura and Oxnard,



Courtesy of Southwest Fisheries Science Center

# rs with Many Mysterious Behaviors

where vessels meet whales as they swim past Anacapa.

Commencing in early February, the northward migration peaks in March; a second surge occurs in April when cow-calf pairs appear. During this time, whale-watch excursions from Santa Barbara offer the best opportunity to view grays. Regularly scheduled trips out of Oxnard and Ventura often see whales at the Channel's eastern end. It is not uncommon to find whales just outside harbor entrances.

Some gray whales head nearly diagonally across the Channel. When they pass Santa Barbara they may be five to seven miles offshore, and possibly following the sea floor's 50-fathom contour line. Once opposite Campus Point in Goleta, they are three miles or less offshore. They then follow the coast to Point Conception. For bluff top whale watching, spring is the best time.

Familiar as the grays may seem to central and southern Californians, many basic queries about them remain unanswered: Do juveniles follow routes learned from their mothers? Do individuals return to the same winter and summer grounds year after year? Can we ever understand which cues these leviathans use to navigate over thousands of miles of seemingly featureless ocean?

Perhaps someday returns from tagged animals will reveal more. In any event, many of the grays' mysteries beg for solutions from future marine mammalogists.

*Charles D. Woodhouse, Ph.D., is curator of vertebrate zoology for the Santa Barbara Museum of Natural History and an inveterate whale-watcher. Text ©1996 Charles D. Woodhouse.*



*Even on this young gray whale characteristic patches of barnacles and specific species of whale lice have already colonized the animal's skin.*

Laura Gorodetzky

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## Sanctuary Dining

*Continued from page 3*

The popularity of the broad shelf northwest of San Miguel became clear over the course of the *Jordan's* surveys. Whales were observed heading toward these feeding grounds from San Miguel's south side, and the whales feeding on the north side of Santa Rosa gradually shifted their attention to northwest of San Miguel. This location appears to be one of the blues' most favored feeding grounds of any along the West Coast.

This year scientists took advantage of the Sanctuary's newly outfitted research vessel *Ballena*. UC Santa Cruz and Sanctuary staff researchers spent three weeks helping WHAPS96 by tagging blue whales. Their radio tags recorded time and depth, and allowed tracking of the whale's position when it surfaced. By making daily trips from a base camp at Bechers' Bay on Santa Rosa Island, the *Ballena* was able to tag and track four blue whales. This greatly increased the number of blues that had been tagged up to that time, but operations in the Channel were hampered by strong northwesterly winds on many days.

The *Ballena* was equipped with a two-frequency echo sounder to detect krill in the vicinity of the tagged whales. Recovered tags showed that blues had fed on krill swarms both near the bottom of the shelf and off the shelf's edge.

Data from two years of WHAPS are now being analyzed, and findings will be compared to past and future surveys off central California and in the Gulf of California. Already clear, however, is the importance of the Channel Islands National Marine Sanctuary waters to the whales.

*Paul Fiedler is an oceanographer with the National Marine Fisheries Service and was chief scientist for WHAPS95 and WHAPS96.*

# The Adventure Continues

By Fred Benko

In January 1973 a diving buddy suggested we fly down to Scammon's Lagoon to see the California gray whales enjoying winter in Baja. I had never seen a whale, any whale, before that time and thought it might be a great adventure to dive with these huge animals.

We flew down in a twin Beechcraft, landed on a dirt strip, and had a frustrating first day trying to snorkel among animals that obviously did not want anything to do with us. At day's end we had not seen anything but a few spouts in the distance. That night, a narrow channel that connected two bays near our camp showed a lot of whale activity.

In the morning, we swam into the channel, sat on the bottom in scuba gear, and waited. In a short

time my friend and I were excitedly signaling to each other as we felt the approach of a whale. Visibility was only a few feet but the channel was so narrow and shallow that the gray swam directly over our heads. We could see its barnacled skin and, most importantly, feel the closeness of its presence. It was an experience that changed my life.

By March of that year, I had quit my job with a pharmaceutical company, bought a couple of boats, and started running fishing and whale watching trips out of Sea Landing in the Santa Barbara Harbor. I have watched with satisfaction as the gray whale herd grew from about 8,000 animals in 1973 to an estimated 21,000 to 25,000 today. For the past five years, I've marveled at the magnifi-



Courtesy of the Condor

*Humpback whales seem almost as curious about humans as humans are of them.*

cent humpback and blue whales that return each spring and summer to the Santa Barbara Channel.

Humpbacks, in particular, are known for their close approaches. At times, they will surround the *Condor*, seeming to compete for passengers' attention. One particularly memorable experience was when a pod of three humpbacks kept us "hostage" last July.

For more than an hour they were seldom more than 10 feet away from the *Condor* as the boat drifted, engines off, in mid-channel. These whales were then joined by three more humpbacks, who completed the encirclement. We watched each other in this manner for hours before it was safe to fire up the engines and return home.

Blue whales, though not as friendly as humpbacks, will sometimes approach the *Condor* and study the people on board. Calves, sometimes accompanied by adults, will present themselves to the boat and hang around, often just under water, for a long time. Given the immense size of these whales the encounters are never to be forgotten.

Santa Barbara is now known as one of the whale-watch capitals of the world. The Channel is generally recognized as holding the highest concentration of blue whales in the world. We used to have a whale-watch season lasting three or four weeks that drew a few hundred passengers. Now the *Condor* runs whalewatch trips most of the year, and we carry more than 20,000 passengers a year.

And those friendly approaches continue to thrill me. After more than 20 years and all these encounters it's still a fabulous adventure.

*Fred Benko is captain and owner of the charter vessel Condor, a respected naturalist, and on the board of directors for the Santa Barbara Civic Light Opera.*



# Sanctuary

## 1996 Year End Report



*The 1,252 square nautical mile area of the Santa Barbara Channel was given special protected status in 1980 because of its exceptional natural resources and beauty. This seawater realm encompasses an area from the mean high-tide line out to six nautical miles from the islands of San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara, and is designated the Channel Islands National Marine Sanctuary. This is a report on some of the activities that took place in the Sanctuary in 1996.*

## Management

The past year has been an exciting one for the Channel Islands National Marine Sanctuary (CINMS). The responsibility to manage, promote and protect the rich diversity found within the Sanctuary has continued to challenge the staff. CINMS has embarked on many new programs that are strategically linked to our congressional mandate and the goals of NOAA. Expanding our staff has better enabled us to meet the basic tenets of the National Marine Sanctuaries Act and to carry out the CINMS management plan.

This annual report separates Sanctuary activities into management, research, and education. However, the lines between these activities are often very thin. Our small staff and the interrelationship of these activities require us to wear different hats and work together to further the mission of CINMS.

The staff of the Sanctuary has been increased to strengthen our ability to achieve the management plan's goals, serve the public, participate in the community and achieve greater resource protection. Lt. Stephen Beckwith, a NOAA Corps officer with extensive experience in fisheries, oceanographic research and the management of research vessels, joined our permanent Sanctuary staff as executive officer.

Colleen Angeles, our new education specialist, is responsible for public relations and coordinating volunteers. We have continued to fund a research coordinator through a grant to the University of California, Santa Barbara (UCSB). An administrative assistant for the office and the *Aloko* editor are also contracted. These individuals greatly increase our ability to meet our needs and the needs of the public.

This year CINMS responded to inquiries regarding the proposed use of low flying jet aircraft within and adjacent to the Sanctuary. Written comments on the Environment Assessment and Supplemental Environmental Assessment were submitted to the Navy. The Navy has canceled this project based on public comment and concern, as well as budget shortfalls.

The Minerals Management Service has established a team to develop permitting procedures for the use of high-energy



photo by SHAUNA FRY

*Executive Officer Stephen Beckwith examines a piece of baleen from a 73 ft. blue whale that washed ashore at San Miguel Island after dying of unknown but probably natural causes.*

seismic surveys in oil and natural gas exploration. The potential impact to Sanctuary resources led CINMS to be one of more than 20 institutions and resource agencies involved in this team development process.

CINMS has a well developed Geographic Information System (GIS) project that is based on regional cooperation among various resource protection agencies. This system is a model for other Sanctuaries to emulate in the development of GIS for use in the National program.

CINMS and the U.S. Coast Guard have been developing a Memorandum of Understanding (MOU) to focus the attention of the Coast Guard on protecting the Sanctuary's resources and to increase the awareness of mariners operating within the Sanctuary. This MOU should be finalized soon.

The staff of CINMS has begun creating tools and response scenarios to prepare for disasters that may threaten Sanctuary resources. A response plan for oil spills, vessel groundings, and other threats is under development. The capabilities of our research vessels have been designed to respond to

### **The Mission of the Channel Islands National Marine Sanctuary:**

*To protect and preserve the extraordinary ecosystem surrounding the northern Channel Islands and Santa Barbara Island, which includes marine birds, mammals and other marine life, and to protect the historic shipwrecks and Native American artifacts found within the Sanctuary's boundaries.*

# Management

Continued from page 1

these types of emergencies. We now carry our GIS database on board and are capable of collecting a variety of water and biological samples.



photo by TOM BAUMGARTNER

Red sea urchins, harvested for their roe or "uni" are an important commercial resource within the Sanctuary.

This year has seen increased coordination of activities between CINMS and Monterey Bay National Marine Sanctuary. Examples include the Great American Fish Count, the use of CINMS's research vessel and the acquisition of a joint patrol aircraft.

CINMS continues to enjoy a fruitful relationship with the Santa Barbara Museum of Natural History (SBMNH) in the areas of education and public awareness regarding the wise use of marine environments. We have begun developing survey tools to evaluate the demographics of the visitor stream to the Sea Center as well other cosponsored programs. Please see the companion section titled "Cooperative Agreement" for highlights of 1996's activities.

CINMS has been working closely with the Santa Barbara Maritime Museum to develop exhibits on the rich maritime resources protected by the Sanctuary. The museum is scheduled to open in the summer of 1997. The vision of the Museum includes interactive exhibits to excite the public about the maritime heritage preserved in shipwrecks and other submerged cultural resources. The Channel Islands National Park (CINP) and Channel Islands Marine Archeology Resources group (CMAR) have partnered with CINMS in developing these new exhibits. Exhibits are also being designed to highlight the historical and current activities of the Coast and Geodetic Survey and the National Weather Service.

In 1997, CINMS offices will be moving to a new location in the Naval Reserve building. Over the past year we worked closely with the City of Santa Barbara to negotiate a new lease and design our new offices. The move is an opportunity for CINMS to reexamine and redesign our office needs based on our expanded activities.

# Research

The goals of the Sanctuary research program are to support, promote and coordinate scientific research on marine resources in CINMS, providing a link to sound management of those resources.

The CINMS Research Activity Panel (RAP) formed in May, provides a forum for discussion and coordination of research efforts and issues in the Sanctuary. This committee helps identify research needs and priorities for the CINMS research program. The panel also improves communication and awareness of Sanctuary programs in the research community.

## Members of the CINMS

### Research Activity Panel include:

- University of California, Santa Barbara (UCSB)
- University of California Natural Reserve System
- University of California Sea Grant Extension Program
- California Department of Fish and Game
- California Coastal Commission
- Channel Islands National Park
- Minerals Management Service
- National Biological Service
- Southwest Fisheries Science Center (SWFSC)
- National Marine Fisheries Service (NMFS)
- Channel Islands Research Foundation
- Santa Barbara Museum of Natural History

The R/V *Ballena*, the Sanctuary's primary research vessel, has been equipped to support a variety of oceanographic and biological studies. The boat carries a 13-foot Avon inflatable with 15 hp Evinrude outboard for shallow-water work and close-up needs. She has a fiberglass hull, measures 56 feet long and 17 feet wide, and draws 5.5 feet of water. The R/V *Ballena* carries four scientists on extended cruises and up to 10 scientists on day trips. The bridge is fully equipped with modern electronics and oceanographic and research equipment.



photo by PASSAGE PRODUCTIONS, © 1996

Scientists aboard the NOAA Ship *David Starr Jordan* search for blue whales as part of the WHAPS 96 project.

The R/V *Ballena* was at sea 122 days in 1996 in support of marine science projects conducted by NOAA, the U.S. Geological Survey, Biological Resources Division (formerly the National Biological Service), UCSB and other entities.

During July and August, the R/V *Ballena* played a leading role in the Whale Habitat and Prey Study (WHAPS 96). The purpose of this project was to study the distribution of baleen whale activity (focusing on blue whales), the distribution of prey, and to estimate how habitat affects the distribution of both whales and their prey.

Using an automatic data acquisition system which relayed salinity, temperature, depth, time and position, the R/V *Ballena* collected surface oceanographic measurements and tracked krill abundance.

Radio transmitters collected data on whale dives. This part of the project involved tagging blue whales with time-depth recorders encased in specially designed crossbow darts. A total of four blue whales were tagged. Once tagged, the *Ballena* followed individual whales and acoustically tracked krill distribution along their paths. Aboard the NOAA ship *David Starr Jordan*, scientists acoustically searched for krill and whales along designated track lines in the Sanctuary and surrounding waters. Krill were captured for analysis and oceanographic data were collected along the tracks.

Detailed optical, chemical and biological measurements are made twice-monthly from the R/V *Ballena* as part of the "Plumes and Blooms" program. The alternating patterns of brown sediment plumes and green algae blooms that occur each year in the Santa Barbara Channel provide researchers with an excellent field laboratory for understanding and modeling the sea's colors. These types of data have been used to track changes in climate. The primary goal of the Plumes and Blooms program is to develop numerical algorithms to relate satellite-scanned ocean color signals to useful data for ocean scientists and coastal zone managers.

During each cruise, transect observations are conducted from the shelf waters north of Santa Rosa Island to just south of Goleta Point. Repeated observations of this transect provide a kind of slow-motion movie of the changing color conditions in the Channel.

The Plumes and Blooms program is a joint collaboration among UCSB researchers at the Institute of Computational Earth System Science, NOAA researchers at the Coastal Services Center (Charleston, SC), and the Sanctuary. CINMS is a co-investigator, providing ship support and the at-sea research experience of two NOAA Corps ship captains.

Rare Ashy Storm-petrels and Xantus' Murrelets were the focus of two seabird studies in the Sanctuary. The breeding success, population size and breeding biology of Ashy Storm-petrels on Santa Cruz Island were the subjects of one study. Four of the Island's five colonies occurred in sea caves, a habitat previously not well documented for this species.

CINMS provided vessel support on eight of the 10 trips to Santa Cruz by the National Biological Service.

Capture and radio-tagging of Xantus' Murrelets were conducted aboard the R/V *Ballena* at night while anchored off Santa Barbara Island. A total of 64 tags were deployed. Radio-tagged birds were found to forage mainly north of Santa Barbara Island in April and early May with a shift to waters south of San Nicolas Island in late May.



*A blue whale prepares to submerge as the Sanctuary's R/V Ballena keeps a respectful distance during WHAPS 96.*

photo by PASSAGE PRODUCTIONS, ©1996

With Sanctuary transportation and assistance, UCSB Marine Science Institute researchers are inventorying coastal marine resources of the northern Channel Islands as a baseline for potential oil spills in the Santa Barbara Channel. This project, which started in March 1994 with a grant from the California Coastal Commission, will provide a database of existing marine life conditions at Anacapa, Santa Cruz, Santa Rosa, and San Miguel islands. Much of the marine survey targets Santa Cruz Island, because intertidal monitoring has not been established there. Oil dispersion models indicate that Santa Cruz Island is especially vulnerable to potential spills in the Channel.

The R/V *Ballena* provided a research platform for a rockfish tagging study conducted by UCSB's Coastal Marine Institute. This project fell under a Minerals Management Service-funded investigation of the ecological consequences of abandoning oil platforms in the Channel.

The complete Channel Islands Geographic Information System Database is housed at UCSB's Geography Department. A user-friendly, smaller version is available at Sanctuary headquarters.

Continuing its long-term role as clearinghouse for scientific information about Sanctuary resources, the CINMS research bibliography has been updated with 500 new records and now contains over 4,000 annotated references. Eventually it will be available as a searchable database on the World Wide Web.

## Education

The goals of the CINMS education program are to create awareness; to provide current and accurate information about marine and cultural resources of the Sanctuary; and to foster an ethic that promotes wise use of these resources. The Sanctuary acts as a catalyst to focus the attention of area agencies and organizations on the extraordinary diversity of this special region.

The Marine Educators' Regional Alliance (MERA) was established in April under the guidance of the Sanctuary. CINMS and Santa Barbara Museum of Natural History (SBMNH) brought together 40 professionals from 20 different area organizations. We shared information on programs, discussed community needs for marine education, and determined how different organizations could work together to develop and enhance marine education programs for the future. We agreed to develop a community strategy to improve the quality and accessibility of marine education. Currently, MERA includes 30 area organizations and meets quarterly. In 1997, MERA plans to design a logo and a Web page, present an outstanding teacher award, and produce a brochure about its member organizations.

CINMS worked closely with Regional Alliance for Information Networking (RAIN) in 1996 to demonstrate a community/government partnership that provides education and public outreach. Since 1991, RAIN has developed innovative Internet access and educational programs. RAIN and CINMS are working closely together with the 30 agencies represented in MERA to develop a comprehensive Web site that provides community learning opportunities to the public.



Divers participating in the Great American Fish Count often attempt to photograph fish, such as this curious garibaldi.

photo by DONNA PERRY ©1988

RAIN has also worked with CINMS and a contracted Webmaster to redesign and update CINMS Web pages, making them more dynamic and interactive. New features include a search engine, video clips, an on-line marine resource directory, a photo gallery, guest book and image maps of the Channel Islands.

CINMS hosted a Great American Fish Count (GAFC) Summit in November to identify opportunities for bringing interested organizations together to form a National Fish Monitoring Network. The Reef Environmental Education Foundation (REEF), which

has developed a successful year-round volunteer diver monitoring program in the tropical western Atlantic, is particularly interested in expanding its program to the West Coast and working with GAFC to develop an integrated Volunteer Monitoring Network. Representatives from 12 other organizations also participated in the Summit, including the National Marine

### Members of Marine Educators' Regional Alliance include:

American Oceans Campaign  
Cabrillo High School Aquarium, Lompoc  
California Department of Fish and Game  
California Seafood Council, Santa Barbara  
California State Parks  
Catalina Island Marine Institute  
Channel Islands National Marine Sanctuary  
Channel Islands National Park  
Condor Charters  
Jean-Michel Cousteau, Inc.  
4-H Development Program  
Island Packers  
Los Marineros Advisory Board  
Marine Mammal Center of Santa Barbara  
The Nature Conservancy  
Passage Productions

Regional Alliance for Information Networking  
Santa Barbara Channel Aquarium  
Santa Barbara City College's departments of  
Marine Biology and Marine Technology  
Santa Barbara County Education Office  
Santa Barbara Maritime Museum  
Santa Barbara Museum of Natural History  
Santa Barbara Parks and Recreation Dept.  
Santa Barbara Salmon Enhancement  
Association  
Surfrider Foundation  
UCSB Cooperative Extension  
Sea Grant Program  
UCSB Environmental Studies Program  
UCSB Marine Science Institute  
UCSB Natural Reserve System

Sanctuary Program, Channel Islands National Park, American Oceans Campaign, Catalina Conservancy, the University of California, Marine Conservation Network (MCN) and RAIN.

As a result of the meeting, REEF has agreed to work with the organizers of the GAFC to develop a scantron survey form and modify existing software so that it can be used for West Coast fish species. GAFC will work with REEF to promote the year-round East Coast program and collaborate on a year-round West Coast program. A curriculum development committee will create a standardized curriculum for training divers. MCN has agreed to become the West Coast coordinator for a National Fish Monitoring Network.

Also in November, CINMS hosted an ecotourism workshop for Cal Poly San Luis Obispo undergraduate students studying natural resources and tourism. A panel representing the Sanctuary, Condor Charters, the Sea Center, Island Packers, and Passage Productions briefed the students on their organizations and how they play a part in the ecotourism within CINMS.

The Sanctuary and the Channel Islands National Park (CINP) agreed to fund a feasibility study on establishment of video transmission sites in the CINMS and CINP and receiving sites on the mainland. The goal of the system is to broadcast real-time presentations to the Sea Center and the CINP visitor center. A permanent video uplink system would be a powerful new educational tool to foster public understanding and appreciation of the natural and cultural resources of the Sanctuary.

Working with the City of Santa Barbara and local designer Marie Murphy, CINMS has developed four interpretive panels for the city's Shoreline Park. It is a perfect spot for panels that feature information on gray whale migration, dolphins, sandy beaches, and the Sanctuary's marine environment.



photo by PASSAGE PRODUCTIONS, © 1996

*Little matches the zest for life of a common dolphin, an example of what a healthy Santa Barbara Channel can sustain.*



photo by VTC COX, © 1995

*Education Specialist Colleen Angeles greets visitors at the Santa Barbara Whale Festival on Stearns Wharf.*

Throughout the year, Sanctuary staff have worked with interns and volunteers from UC Santa Barbara, Santa Barbara City College, Brooks Institute of Photography, and Westmont College. These students have contributed more than 500 hours to research and education projects, Sanctuary cruises, presentations to local schools, beach clean-ups and community outreach events.

Staff and volunteers participated in the following public outreach events in 1996: Whale Festival, Earth Day, Santa Barbara Harbor Festival, SBMNH Afternoon for Educators and Ventura Sea Fair.

The Sanctuary has established a library of slides and other resources (including books, bibliographies, reprints, directories and all of the printed materials produced and obtained by CINMS). It has a central database and cataloging system which are available to Sanctuary staff, teachers, students, researchers and other interested individuals.

### **Sanctuary Staff**

- Lt. Cmdr. Edward Cassano, Sanctuary Manager
- Lt. Stephen Beckwith, Executive Officer
- Dr. Jenny Dugan, Research Coordinator
- Laura Gorodezky, Education Coordinator
- Colleen Angeles, Education Program Specialist
- Kari Boylan, Administrative Assistant



SANTA BARBARA MUSEUM  
OF NATURAL HISTORY

# The Cooperative Agreement

## 1996 Year End Report



*The cooperative projects of the Santa Barbara Museum of Natural History and the Channel Islands National Marine Sanctuary*

The Sea Center was created as the focus of a joint partnership between the Channel Islands National Marine Sanctuary and the Santa Barbara Museum of Natural History. By now the Sanctuary and the Museum have enjoyed more than a decade of providing educational experiences that focus on the Santa Barbara Channel region, with a special emphasis on Sanctuary waters.

Two unusual finds from the Channel, collected by commercial fishermen, were given temporary homes at the Sea Center. One was a rare fish and the other a rare octopus.

In April, a 60-pound, male giant Pacific octopus, *Octopus dofleini*, was captured a few miles south of the Santa Barbara Harbor. The Museum's curator of invertebrate zoology, a recognized authority on cephalopods (octopuses and squids), confirmed that the octopus was indeed a mature male, the first documented in our area and the first in coastal waters. Following measurement, sex determination, and weighing, several Los Marineros students on a cruise to Santa Cruz Island were on hand to observe its release. Underwater videographer Tom Campbell documented the healthy animal's return to the ocean. Giant Pacific octopus normally reside in the cold waters of the Pacific Northwest. Santa Barbara is at the southern end of their range, so most individuals accidentally captured are usually from deep waters around the Channel Islands.

The other unusual visitor was a spotted batfish, *Zalieutes*

*elater*, one of five known recorded specimens from California. Captured near Goleta Pier in July, the live fish was added to our flatfish tank. With its extremely flattened body and habit of walking about on modified pectoral fins, the fish made a very curious sight for visitors.

Growth, experimentation, and new challenges characterized 1996 for the Sea Center in Santa Barbara. The Center received 71,838 visitors, of which 12,336 were museum members (17%). Classes and tours at the Sea Center continued to be successful with 7,318 students participating in our programs. Approximately 850 of these students were involved in the Los Marineros program.

A large mural of sea lions cavorting through an island kelp forest was installed at the Sea Center in January. Mural artist Brian Landis of Earthworks provided the mural at no cost. The Sea Center is an ideal location for the 10 x 20-foot mural, which adds the ambiance of an underwater world to our interior spaces.

Beginning with the summer months, the Museum made an intensive effort to engage visitors by providing presentations and talks on natural history topics. At the Sea Center, staff made daily presentations by providing presentations and talks on natural history topics. At the Sea Center, staff gave daily presentations, wharf walks, and interactive demonstrations about plankton, touch tank specimens, grunion fish, and sea stars.

All presentations involved an introduction to the diversity of marine life, the creation of the Sanctuary, and the missions of our agencies. Participants' evaluations documented the usefulness of a more active program to teach about our region. Presentations were continued on weekend and holiday schedules and more topics are planned, including sharks, whales, and other marine mammals.

Throughout 1996, architectural plans and permits for the construction of the touch tank canopy were elaborated. In August, we took bids from contractors. After fund-raising and private donations to help cover construction costs in excess of \$125,000, the Museum signed a contract for this important addition to the Sea Center. With the larger, permanent canopy in place, the Center's most popular exhibit will be available to visitors in all weather. The new canopy will greatly enhance our ability to provide public presentations within the touch tank amphitheater space.



photo by LAURA GORODEZKY

A pod of Los Marineros students gather around the touch tank at the Sea Center.

## Los Marineros

In 1996, for the first time in its 10-year history, the Los Marineros program reached every fifth-grade student in the Santa Barbara School District—32 classes at 10 elementary schools. As the program concludes its first decade, plans are underway to update the Los Marineros Curriculum Guide to align it more closely to the California State Science Framework and the new national science standards.

A series of fall beach clean-ups of the Santa Barbara waterfront by Los Marineros students yielded important data on the cleanliness of local beaches. These data, along with pictures, student comments, and examples of debris collected, was displayed in a special exhibit. Titled "Turning the Tide on Trash," it was installed at the Sea Center last January. The entire project, which was funded by Chevron Production Companies, included a formal presentation (in Spanish and English) to the Mayor and Santa Barbara City Council. Los Marineros students at Cleveland School made the presentation. The project will be repeated in 1997, with the addition of a virtual exhibit, "Turning the Tide on Trash II," on the Internet.

In October, Los Marineros, Sea Center and CINMS staff organized "Buckets, Baleen, and Other Beachy Stuff," a professional development seminar for members of the Southwest Marine and Aquatic Educators Association (SWMEA) that was hosted jointly by the Museum and the Sanctuary. The 55 attendees from throughout the southwest began the day with a walking tour of Stearns Wharf, followed by a chance to observe the Los Marineros students participating in the Sea Center's "Oceanographer for a Day" program. Later, at the Museum, presentations by Island Packers, Catalina Island Marine Institute, and the Cabrillo Marine Aquarium gave SWMEA members a chance to learn how other institutions use hands-on materials in their public and school programs.

Los Marineros staff were joined by CINMS staff for "Making Waves," a series of marine education workshops for elementary teachers throughout Santa Barbara County. These day-long workshops at the Museum and at Lompoc's Cabrillo High School, gave participants the chance to try hands-on



*A Los Marineros student explains to his peers how Stearns Wharf pilings provide a structure for marine invertebrate settlement.*

photo by LAURA GORODEZKY

marine science lessons from the Los Marineros curriculum. Funding for the workshops came from Santa Barbara County through the Coastal Resource Enhancement Fund.

## Whale Corps

Early in 1996, the Museum and Sanctuary embarked on a new volunteer program which was christened the Whale Corps. Volunteer naturalists received extensive training on the biology of whales and local coastal history in preparation for serving aboard a Santa Barbara commercial whale watching vessel, the *Condor*. During the coastal gray whale watching season from February to April, these volunteers augmented the whale-watching experience by providing demonstrations with whale baleen and other materials, showing maps of the region, and offering information about the Sanctuary and Museum.

In addition, Whale Corps volunteers staffed information booths at several community events, including the Whale Festival, Earth Day and Harbor Festival in Santa Barbara, and the SeaFest and Channel Islands National Park Appreciation Day in Ventura.

Following the gray whale migration season, Whale Corps members received additional instruction from Museum and Sanctuary staff on blue and humpback whale biology. This was in anticipation of the summer season of watching the great whales. In addition, researcher John Calambokidis discussed the techniques of photo identification of whales. A select group of Whale Corps members used these techniques during a public whale-watching excursion.

Whale Corps members collected important whale sighting information during trips aboard the *Condor* and added more than 500 sighting reports to the Museum's database. The success of this program is a tribute to the Museum and Sanctuary staff as well as to the contributions of the charter boat operator and whale researchers.

In May, a gray whale cow and calf, who had become entangled in mooring lines at an unknown location and drowned, stranded on Santa Barbara beaches. With the aid of Whale Corps members, interested volunteers, and heavy equipment and operators, the



*Manager Gary Robinson explains the history of Stearns Wharf to participants in an October Marine Educators' workshop sponsored by the Sanctuary and the Museum.*

photo by LAURA GORODEZKY

entire skeletons of both animals were salvaged and transported to the Museum for cleaning. The preparation of these skeletons is expected to take over a year.

Interestingly, both specimens are nearly identical in length to the two fiberglass models of a cow-calf pair of gray whales on display at the Sea Center. Once preparation of the skeletons is complete, they will become part of the Museum's permanent collection. They may be mounted for later display.



photo by TERESA ROUNDS

Sea Center Manager Gary Robinson (right), and volunteers Jeff Bingham and Anthony Van Leuwen prepare to remove ribs from the gray whale stranded on a Santa Barbara beach last May.

## Other Cooperative Projects

The Sanctuary's quarterly publication *Alolkoj* maintained its circulation at 3,000, but expanded its presence in libraries. The publication reaches a broad audience of scientists, lawmakers, teachers and students. It is now found in the periodical sections of public libraries in Goleta, Santa Barbara, Montecito and Carpinteria. This year's themes included Santa Barbara Channel research (Spring), marine education (Summer), shipwrecks and rescues (Fall) and whales (Winter). Vic Cox, *Alolkoj* editor for the past three years, has left to pursue a full-time position at UC Santa Barbara. The Sanctuary is in the process of hiring a new editor.

With support of the National Fish and Wildlife Foundation, PADI Foundation, ARCO, Project Aware, and other individual donations, the curriculum and kits for "34 Degrees North: Sanctuary Interaction" were completed. The curriculum is designed for middle school students and uses examples from the Sanctuary in chapters on geography and navigation, geology, diversity of marine life, habitats and climate, ecosystems, and Sanctuary management simulations.

Public excursions into Sanctuary waters were again offered in 1996. Five Sanctuary cruises revealed the dynamic beauty of these waters to participants. Blue whales, Risso's dolphins, Dall's porpoises, seals and sea lions delighted passengers. In addition, visitors were treated to underwater video uplinks to

the *Condor* provided by Passage Productions. These described the community associated with island kelp forests. An onboard touch tank rounded out the experience. The October cruise had a special focus on the submerged shipwreck of the *Winfield Scott*, a paddle wheel steamer dating from the 1850s. The cruise added another dimension to public recognition of the Sanctuary's cultural resources. In September, the annual underwater photographic workshop led by Tom Campbell was a sponsorship by the Sanctuary and Museum. Approximately 20 divers enrolled in the course. Dive sites near San Miguel, Santa Rosa and Anacapa islands were visited with divers receiving instruction and assignments in macro and wide-angle photography. Renowned *National Geographic* photographer David Doubilet accompanied the group. He documented the Channel Islands National Marine Sanctuary for an upcoming article about the 25th anniversary of the National Marine Sanctuary Program. By providing a slide show and encouraging the use of photography to enjoy the natural environment, David Doubilet added to the enjoyment of the trip for all.

In retrospect, it was a very busy year. The Whale Corps and the active presentation programs represent new areas of activity for our staff. Unusual occurrences of marine animals and circumstances leading to the recovery of gray whale skeletons punctuated the year. And as always, trips to Sanctuary waters provided wonderful images and memories of what makes this marine environment such a treasure.



photo by TOM CAMPBELL, ©1995

Education Coordinator Sarah Ettman-Sterner discusses how giant brown kelp plays an important role in the Sanctuary ecosystem during a sanctuary cruise.

### Museum Sea Center Staff

Gary Robinson	Manager
Jennifer Gray	Administrative Assistant
Sarah Ettman-Sterner	Education Coordinator
Michelle McCutchan	Education Program Assistant

# Really Wild: A Naturalist's View

By Mary Stack

No matter how sweet and friendly they may look to our eyes, wild animals do what they have to do to survive. I learned about their unpredictability with the first seal I helped to capture and rehabilitate for the Marine Mammal Center of Santa Barbara.

Despite being held down by four experienced adults for treatment of a broken flipper, the little fur seal, which could have been mistaken for a cute, if larger than usual, stuffed animal, lunged forward and tore the crotch out of my jeans. After hearing that story, very few people are inclined to pick up stray seals they find at the beach, no matter how cute they appear.

Telling stories is a time-honored method of teaching. I use it in presentations as a volunteer educator for the Marine Mammal Center and as one of the naturalists for the new Whale Corps. The stories I bring aboard the whalewatch boat *Condor* attempt to educate people while they are among living animals at the edge of their environment.

Whether in a classroom or on board the *Condor* one question I am frequently asked is, "How intelligent are whales and dolphins?" Such things as brain size to body mass ratios are tempting facts, but I like to tell about the little humpback I met in 1992.

One day in May, a small female humpback whale spent over an hour with a whalewatch boat in the Santa Barbara Channel. She circled the idling boat, popping her head out of water to eye level in a behavior known as spy-hopping. She did this at the bow, then the starboard, stern and port sides. Sometimes she drifted in the water on her side, her red-rimmed eye looking up at the people lining the rail.

It was a magical day, but I don't know what she was really doing, much less thinking. Later that week she approached a second boat in a similar fashion.

What I do know is that six weeks later, the same whale engaged one of the same boats. This time she had a larger humpback whale with her. She spent an hour going back and forth from the boat to the larger whale. It appeared as if she were coaxing the larger whale to come see her new plaything. At last the whales floated on either side of the boat, gently touching the hull.

Were they just curious? Was the small one teaching the larger whale about boats and their inhabitants? There is no way to really know, but I loved the experience—and how many people can pull out photo albums and show visitors closeups of whale lice, humpback lip hairs and the insides of blow holes?

Walking the decks of the *Condor* with whale baleen and a bottle of dried shrimp allows me to meet people in small groups and respond to their queries. Worried passengers may



©David O. Brown, Passage Productions 1994

*Dolphins often approach boats to ride the bow wave, apparently for the sheer fun of it, though no one knows for certain.*

ask, "Is there any danger of the whale hitting the boat by accident?" After reassuring them that the whales are very aware of everything around them, including our boat, I usually tell them about another young adult humpback whose curiosity almost gave me a headache.

The adolescent humpback showed great interest in us and after a number of circuits around the boat, it put its tail flukes in the air and draped them over the railing without touching it. I was standing at the railing and one fluke grazed my head. Slowly the flukes moved most of the length of the boat, delicately suspended in mid-air, then slipped into the sea. That whale knew exactly where her body was.

Since those summer experiences, a number of humpback whales in the Channel have approached boats for friendly encounters. To me this means more opportunity to share a world I enjoy with other people—and my stories now seem more believable to them.

Mary Stack is assistant director of the Marine Mammal Center of Santa Barbara. Text ©1996, Mary Stack.

# It's a Whale of a Business, and Growing

By N. Douglas Bradley

These days, Fred Benko is a happy man. His charter boat *Condor* has probably shown more people their first wild whales than any other boat on the planet, and business shows no sign of letting up.

"We started this business [in Santa Barbara]," Benko said, "when whales were still on the brink of extinction and few people wanted to see them. Now people come in droves." He estimated the *Condor* alone took close to 20,000 people whale watching last year.

One of the oldest whale-watching businesses in central California, Benko's is hardly the only game in town these days. A recent, informal survey of Santa Barbara and Ventura area whale-watching businesses suggests that whale trips have bloomed into a major industry, one that serves nearly 90,000 sight-seers annually.

Moreover, whale watchers are making their presence felt financially in ways that few would have suspected two or three years ago. Gone are the days when whale watching was restricted solely to family fun afternoons and school groups. Today, many international travelers plan their trips to the Santa Barbara Channel with the sole objective of seeing Earth's largest animals. They and other overnight visitors leave millions of dollars in their wake at area hotels and restaurants.

Ironically, whale-watching businesses themselves realize only a tiny fraction of this revenue, since they must keep costs low to remain competitive.

Across from the *Condor's* berth at Santa Barbara's Sea Landing, the catamaran *Double Dolphin* waits for passengers to board. Skipper Randy Schweitzer muses about whale watching and where it is headed. "Probably two out of three people go offshore to see the whales," says Schweitzer. "A third of our clientele also want to see the islands and the rest of the Sanctuary."

"We do more and more business now from the Internet," he noted.

The *Double Dolphin*, like most other whale-watching charters, maintains a two-season schedule. The winter season—commencing around Christmas and ending sometime during late spring—offers two- to three-hour tours to see gray whales as they migrate southward to Mexico. Because grays frequently pass close to shore, they offer most visitors their best chance of seeing a whale quickly. The summer season is characterized by longer trips toward the Channel Islands to see the newest, and largest, attractions—blue whales and humpbacks.

For this article, most whale businesses requested that their individual statistics be kept confidential. Collectively, their numbers suggest that operators between Morro Bay and Ventura now receive between 75,000 and 90,000 whale watchers annually. Moreover, all charters reported their numbers increasing steadily in recent years, especially during the summer months.

Most charter boat skippers cite the regular return of blue whales to the Channel as the prime change in the whale-watching equation. Blues were first spotted in 1989, but by 1992 their visits almost seemed scheduled. Local charters responded quickly to the public's curiosity.

"More and more of our European clients want to see blues," said "Captain Don" Hedden of the *Rachael G*. "The fish, birds and islands always attract people, but blues are a real sensation. They've renewed people's hope in the whole environmental effort."

All charters interviewed noted a sharp international interest in blue whales due to extensive media coverage. While sighting the world's largest animal still eludes some visitors—blue whales are a rare and endangered species—it has extended whale watching to an almost year-round industry.

Whether blues will keep returning to the Channel is the big question. "They follow the krill," explained Hedden. "As long as there are krill to eat, they'll probably be around, but nobody knows that for certain."

Larger whale-watching vessels, like the *Rachael G* and *Condor*, have been joined by other, smaller ventures. Dennis Longaberger,



Courtesy of the *Condor*

To the delight of whale watchers this spy-hopping humpback exhaled as it poked its head above the water.

# Larger with Each Season

skipper of the *Sunset Kidd*, a small “six-pack” tied up at Santa Barbara’s breakwater, cites his sailboat’s silence as an advantage which larger, motorized vessels lack.

“While those other guys are growling around, we can hear whales even in the fog [when they surface],” said Longaberger. He estimates that approximately one-third of his clients charter his vessel chiefly to look for whales. “Everyone wants more information about whales, but mainly they just want to see one.”

In Ventura Harbor, Island Packer Cruises’ Lil Connally confirmed her clients’ excitement at spotting whales while touring the Channel Islands. Island Packers, which receives most of its clients from Los Angeles and inland areas, also caters to school groups and families.

Where whale-watching businesses will head next is as elusive as the animals for which they search. Some vessels have plans to add hydrophones to allow clients to listen to whales. Most larger charters are expanding their interpretive services, with more naturalists planned and new activities for clients.

While everyone in the whale-watching business acknowledged increased competition for clients, there is general agreement that respect for the whales stands as everyone’s top



Courtesy of the Condor

Blue whales in the Santa Barbara Channel often match the size of the area’s largest whalewatch boat, the 88-foot Condor.

priority. “If anyone gets too close to a whale in this business or does anything out of line, the first people you’ll immediately hear from are those on board,” said the *Condor*’s Benko. “The watchers themselves ensure that whales command respect.”

*N. Douglas Bradley is a technical writer living in Solvang and a reserve lieutenant with the U.S. Coast Guard’s Marine Safety Office in Santa Barbara.*

## Whale Watching Tips for Private Boaters

1. Remain at least 100 yards away when approaching whales.
2. Never place your vessel between a mother whale and her calf.
3. Do not herd whales in a direction you want them to go.
4. Do not pinch whales between the open ocean and rocks or kelp beds. They may become beached.
5. Approach whales from behind or on a parallel course, never head-on.
6. If approached closely by whales while motoring, reduce speed and shift to neutral.
7. Do not crowd professional whale-watching vessels. When encountering other whale watchers, wait your turn from a distance, then approach cautiously after they have left the area.
8. Report all incidents of harassment of marine mammals to your local Coast Guard office.



Douglas Bradley

Randy Schweitzer owns the twin-hulled charter catamaran, *Double Dolphin*.

# Learning from Dead Whales

By Shauna Fry & Krista Fahy

When two dead gray whales floated ashore at Santa Barbara last May it was a sad event for the animals but an unusual opportunity to gather data for science—if people could move fast enough. With a calf at the city's East Beach and a cow on the county's nearby Butterfly Beach it soon became clear to anyone downwind that the animals were decaying rapidly. The local Natural History Museum's salvage team swung into action.

NOAA's National Marine Fisheries Service (NMFS) charges the museum with investigating the deaths of marine mammals along the coastline of San Luis Obispo, Santa Barbara and Ventura counties. In this case, the dead whales had become entangled in buoy lines and were presumed to have drowned. Four buoys were recovered, but a subsequent NMFS inquiry failed to pinpoint their origin. The entanglement could have occurred in either U.S. or Mexican waters.

Led by Charles Woodhouse, curator of vertebrate zoology at the museum, and Gary Robinson, Sea Center manager, the salvage team set about recovering the skeletons from the intact cetacean carcasses. Armed with large flensing blades, an enthusiastic group of Whale Corps and Sea Center volunteers first dissected the 24-foot calf. City equipment then buried the calf's remains.

The 38-foot adult female gray was much more difficult, partly due to the rising tides on the narrow beach that was her final resting place.

A county earth-moving vehicle helped with the heavier bones.

Using many knives, sharpening tools, protective coveralls and rubber gloves, the salvage team devoted hundreds of hours over an 11 day period dismembering both whales. Under the supervision of Woodhouse and Robinson, a total of 35 people were involved in getting the bones off the beaches and to the museum where further preparations could be performed.

Once at the Museum, where parts like the flippers were further reduced, each bone was steam cleaned and soaked in a large vat of water to remove excess fat, oil and tissue. Tissue and organ samples were taken to ascertain cause of death. DNA tests may also offer insight into genetic connections between the two whales—it is unknown if these were a mother/calf pair—and with the stocks of grays that annually pass through the Santa Barbara Channel.

Upon final preparation of the skeletons, one of each animal's ear bones (bullae) will be sent to the National Marine Mammal Laboratory in Seattle. There the bullae will be sectioned in an attempt to age the whales.

After much work, the skeletons will be re-articulated for display. The female's length makes her the largest in the Museum collection. Though unfortunate, the deaths of the cow and calf will serve to answer scientific questions and provide educational opportunities for many years to come, thanks to the efforts of the volunteer salvage team.

Shauna Fry is coordinator of the Whale Corps; Krista Fahy is assistant curator of vertebrate zoology.



Mauricio Gomez

*The Santa Barbara Museum of Natural History salvage team prepares to dismember a dead, 38-foot-long gray whale that washed ashore at Butterfly Beach. Later, Sea Center Manager Gary Robinson takes apart one of the giant flippers for preparation and curing.*



©1996, Terry Smith

## Research

# Reading the Channel's Color

By David A. Siegel, Ph.D.

Each year, winter rains wash sand, mud and other debris into the Santa Barbara Channel. During the spring and summer, tiny single-celled plants, called phytoplankton, dramatically increase in numbers, expanding the primary energy source for the entire marine food web.

This combination creates an alternating pattern of brown earth sediments and green marine algae, which is initially suspended in the Channel's waters. Then it slowly sinks to the Santa Barbara Basin floor. This pattern of sediment deposits mimics the structure of a tree's growth rate, which can be traced by its rings. Annual changes in important climatic or terrestrial processes, such as rainfall and forest fires, can be detected through tree-ringlike sedimentary patterns. Researchers have even used these data for assessing changes in fish species abundances.

Understanding the sources of sedimentary layers and how they relate to upper ocean productivity are critical questions for interpreting this important geological record. Answers are emerging from the sea's colors.

Characteristics of reflected light directly relate to the kinds of particulates and dissolved materials in the water. UC Santa Barbara ocean scientists, in a project called Plumes and Blooms, are using the Channel's alternating patterns of brown sediment and green algae to build models for extracting information from the colors of the sea. This has required detailed, state-of-the-art optical, chemical and biological oceanographic measurements.

Working with Steve Beckwith and Ed Cassano of the Channel Islands National Marine Sanctuary (CINMS), we conduct twice-monthly research cruises on the Sanctuary's R/V *Ballena*. During each cruise, we make a transect of observations from the shelf waters north of Santa Rosa Island to the area just off Goleta Point. These repeat observations provide us with the equivalent of a slow-motion movie of the changing color conditions in the Channel. We will also stage special cruises when unusual conditions warrant, such as heavy rains washing down fresh sediment.

Measurements made on these cruises include temperature and salinity, ocean color spectra, and water column profiles of red light transmission and chlorophyll fluorescence (indices of suspended particulate load and phytoplankton abundance). By collecting water samples along the transect, we can determine if

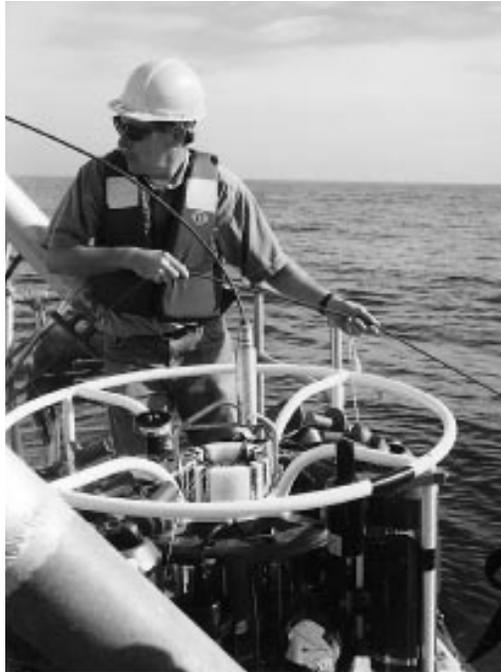
the particulates are from either sediment plumes or phytoplankton blooms. These data are used to test numerical models linking ocean colors to sediment and phytoplankton characteristics.

Several satellite sensors will be deployed over the next year, each having the potential to make detailed maps of ocean color. Imagery will be acquired using the Institute for Computational Earth System Science's (ICESS) satellite antenna at the University. With this suite of information, we can develop numerical models which link the ocean color observed from space to the varying water conditions present in the Santa Barbara Channel.

Funding is primarily provided by NOAA and the U.S. Office of Naval Research. The NOAA Coastal Services Center will use our results to help other coastal zone resource managers as well as the manager of the CINMS. All field and satellite data will be made available to interested parties via the Internet (<http://www.icess.ucsb.edu/PnB/PnB.html>).

Knowledge of the composition, concentration, and origin of suspended and dissolved materials in the U.S. coastal ocean is critical for properly monitoring marine resources and evaluating the impact of human activities. Detailed ocean color models are required if coastal zone managers are to take advantage of the global investments made in satellite-borne ocean color sensors. The Plumes and Blooms project is a good first step towards this goal.

*Plumes and Blooms* Coordinator David A. Siegel is associate professor of oceanography with ICES and the Geography Department at UC Santa Barbara.



David Menzies, an engineer with UCSB's Institute for Computational Earth System Science, prepares a water sampler package of eight separate bottles.

Libe Washburn

## Research Vessel Activities

The R/V *Ballena* spent September through November:

- Completing the 1996 National Biological Service Ashy-Storm Petrel Monitoring Project along Santa Cruz Island;
- Continuing support for UC Santa Barbara rockfish studies;
- Providing Passage Productions a platform from which to document the Sanctuary;
- Conducting "Plumes and Blooms" research trips.

The vessel also aided Monterey Bay National Marine Sanctuary by supporting UC Santa Cruz researchers.

## Channel Tidings

### Sea Turtle Recovers at UCSB Marine Lab

A two-foot-long olive ridley sea turtle, which weighed 57 pounds when first found on Goleta beach last October 8, has gained 14 pounds after nearly three and one-half months of recuperation under the care of the Marine Mammal Center at the nearby UC Santa Barbara Marine Science Institute. The olive ridley, which is rarely seen outside of warm tropical waters, is kept in MSI's salt water tanks and fed regularly by Marine Mammal Center volunteers.

Working with exotic animal veterinarian Susan Hoegeman, MMC Assistant Director Mary Stack organized feedings until the reptile started eating on her own. One pleased MSI employee reported that by Thanksgiving the female sea turtle "was eating like a pig."

The turtle's main problem seemed to be excess buoyancy. It initially floated so high that submerging to hunt for food was very difficult. Tests with ultrasound and x-rays failed to reveal the cause of the buoyancy, but further examination is planned. She is currently floating lower in the water and attempting to dive after food on her own.

Tidings continues on page 15

# WWII Oil-filled Tanker Found Near Monterey Bay Sanctuary

An oil tanker sunken during World War II poses a potential threat to the Monterey Bay National Marine Sanctuary, according to Manager Terry Jackson. It was found, apparently still filled with crude oil, last November in 900 feet of water adjacent to the Marine Sanctuary by a Delta Oceanographics two-person submersible.

The November expedition left from Santa Barbara by means of an Oceanographics research ship. Guided by the mother ship, the 16-foot submersible made four, two-hour dives to where the tanker *Montebello* sat upright on the seabed.

During the course of the dives the hull appeared intact in the area where eight of the 10 storage tanks are located. Two other tanks ruptured when the tanker was torpedoed by a Japanese submarine.

Archaeologist Jack Hunter, who led the

search, said that the tanker is in good enough shape that no immediate leakage is likely. The cold water has solidified the remaining oil to a consistency somewhere between tar and Jell-o, he surmised.

Still, the find has stirred a debate about other sunken ships and what kind of toxic materials they might contain and how such sources of marine pollution might be handled. As for the *Montebello*, Hunter recommends the ship be monitored over the next decade until technology exists to draw out the oil without danger of a spill. It is thought that the tanker holds more than 3 million gallons of crude oil.

The *Montebello* was carrying more than 4 million gallons when she left Port San Luis near Pismo Beach, California, on Dec. 23, 1941, and headed north. Hostile action sank the 440-foot tanker a few miles off Cambria; no lives were reported lost.

## Sanctuary Adds to Staff Resources

Sanctuary staff has grown this year with the addition of a new program specialist, Colleen Angeles, and a research specialist yet to be determined.

Colleen started working for the Sanctuary as an intern in 1995 and has now secured a full time contract as Education Program Specialist. Her duties include coordination of the Sanctuary-sponsored Marine Educator's Regional Alliance, public relations and coordination of volunteers.

In order to accomplish its mission, the Sanctuary has made it a priority to expand its intern/volunteer core. The Sanctuary is fortunate enough to currently have seven student interns/volunteers: Michael Kahle, Adam Petuskey, Jackie Campeau, Jeff Holden, Claire Johnson, Christi Pattengill, and Brice Simmens. Sanctuary staff look forward to working with four additional student interns next quarter.

## Sanctuary Waves

A roundup of selected activities—from August to November 1996—relating to the Channel Islands National Marine Sanctuary (CINMS) off Santa Barbara, California.

Ecotourism in Santa Barbara generally, and the Sanctuary specifically, drew a group of students from Cal Poly at San Luis Obispo at a special CINMS presentation in November.

Sanctuary personnel:

- Worked with list server R.A.I.N. to build a resource guide into the Sanctuary Web site;
- Joined Channel Islands National Park staff in a kelp monitoring cruise;
- Hosted, with the Sea Center, a new training class for Whale Corps recruits;
- Joined a NOAA-wide GIS team;
- Conducted a successful Sanctuary cruise focusing on shipwrecks;
- Joined Minerals Management Service's Seismic Survey Team.

# Santa Barbara to Celebrate Whales, Sanctuaries in February

Santa Barbara raises a joyful noise about the annual migration of gray whales through the Channel with a Whale Festival on Saturday, February 8, on Stearns Wharf and lower State Street. The celebration continues February 9-16 with the Week of the Whale, which is co-sponsored by the local Museum of Natural History and the Channel Islands National Marine Sanctuary. This year marks the 25th anniversary of the National Marine Sanctuary Program.

There is nothing gray about the Whale Festival, which indulges in food, music, crafts for sale, and a beer garden. Booths sponsored by educational organizations, including the Sanctuary, will greet visitors as they make their way along Stearns Wharf. The Sea Center will present Whale Corps volunteers, who will share experiences and detail the many fascinating features of whales throughout the day. The Whale Corps is a cooperative project of the Sanctuary and the Museum.

Not to be missed is the Great (Rubber) Duck Race. This fund-raiser for the Sea Center and other marine education groups asks a \$5 donation for each toy duck entered, but returns nice prizes to the champion yellow duck the tide brings in first.

Festivities continue at the Museum in the evenings with a marine mammal film series throughout the week. The series screens the work of some of the best nature cinematographers in southern California, professionals who have contributed to the Discovery Channel, British Broadcasting Corp. and programs such



*The skull of a young gray whale draws the attention of a visitor during the annual Whale Festival on Santa Barbara's Stearns Wharf.*

© 1998, Vic Cox

as "National Geographic" and Disney's "Audubon Animal Adventures." Film clips and commentary will include blue, humpback, beluga and gray whales, dolphins and sea otters.

Bring the kids every day, beginning Sunday, February 9, for activities on the Museum grounds, including creative projects by Art from Scrap, mural painting, assembling a dolphin skeleton and opportunities to simulate whale blubber. There is no charge for the children's activities.

Tickets for the marine mammal film series will be on sale at the door. Museum member prices are \$4 for adults and \$2 for children 12 and under; nonmembers add one dollar to each category.

Proceeds from this event benefit the Whale Corps. Call the Museum (see back page) in early February for a listing of film titles and times, or visit the Sanctuary's Web page (see back).

## Channel Tidings

Continued from page 14

### Fish Counts to Go National

Organizers of the Great American Fish Count and Reef Environmental Education Foundation have joined forces to create a national fish monitoring network. CINMS recently hosted a "fish watching summit" where representatives of NOAA, the National Park Service, and several nonprofit environmental groups, such as the American Oceans Campaign and the Marine Conservation Network (MCN) forged a plan to integrate their efforts into a national structure. The MCN agreed to be the West Coast coordinator for the network.

### New Guide Out on Sea Mammals

Californians are starting to snap up copies of Alaska Sea Grant's Guide to Marine Mammals, according to its editor, Kurt Byers. No wonder. The guide covers many of the animals that travel to or past the Santa Barbara Channel Islands. There are 17 cetaceans, 10 pinnipeds, the polar bear and the sea otter described in a water-resistant, pocket-sized book that goes for \$16, plus tax. For details, write Alaska Sea Grant, P.O. Box 755040, Fairbanks, AK 99775-5040.





U. S. Department of Commerce  
National Oceanic and Atmospheric Administration  
Channel Islands National Marine Sanctuary  
113 Harbor Way  
Santa Barbara, CA 93109

Address Correction Requested

# Alolkoy

**Need more information?  
Contact:**

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National Marine  
Sanctuary**

113 Harbor Way  
Santa Barbara, CA 93109  
805/966-7107  
email: [cinms@rain.org](mailto:cinms@rain.org)  
web page: [www.cinms.rain.org](http://www.cinms.rain.org)

**Channel Islands  
National Park**

1901 Spinnaker Drive  
Ventura, CA 93001  
805/658-5700  
web page: <http://www.nps.gov/chis/>

**Santa Barbara Museum  
of Natural History**

2559 Puesta del Sol Road  
Santa Barbara, CA 93105  
805/682-4711  
web page: <http://www.rain.org/~inverts/>

**Sea Center**

211 Stearns Wharf  
Santa Barbara, CA 93101  
805/962-0885

## Things to Do, Places to Go

### *Looking for the Channel's Whales*

Gray whales are now migrating both south and north toward Arctic feeding grounds, which signals the onset of the whale-watching season in the Santa Barbara Channel. Ventura-based Island Packers launched its daily, three-hour nonlanding excursions right after Christmas. Prices: \$21 for adults; \$19 for seniors; \$14 for children 12 and under. Call (805) 642-1393 for reservations or more details.

The *Condor*, out of Santa Barbara's Sea Landing, started whale trips on December 26 with day-long trips to Santa Cruz Island narrated by Whale Corps naturalists. These trips run \$65 for adults; \$35 for children 12 and under. Short cruises three times a day in search of grays start in mid-February and cost \$24 for adults and \$14 for children. For more details call Sea Landing: (805) 963-3564.

The Santa Barbara Zoo also sponsors a whale watch on March 29, from 10 a.m to 2:30 p.m. It starts with a light breakfast at the Zoo and a talk on the grays. Cost: \$25 for adults and \$20 for children; nonmembers add \$5. Call (805) 962-5339 with questions.

### *Santa Barbara Whale Festival*

Stearns Wharf, at lower State Street, is this year's center for the annual Whale Festival on February 8.

The music, food and fun start at 10 a.m. and run until 5 p.m.

This year the festival also kicks off a whole week of marine mammal films and children's activities sponsored by the local Museum of Natural History and the Sanctuary. The films start at 7 p.m. and are shown from February 8-16; the hands-on fun for the kids goes February 9-16. Call the museum (see sidebar) for details.

### *Hollister Ranch Tide Pools*

Relatively unaffected by humans, the rich tide pools of Hollister Ranch west of Santa Barbara are again featured in a Natural History Museum field trip. The museum is asking possible participants to choose between February 8 or March 8. Cost is \$18; nonmembers add \$5. Call (805) 682-4711, ext. 315, to get details.

